Senix Corporation

Model ULTRA-30-VA
Ultrasonic Material Sensor

“Non-Contact” Sensor

The ULTRA-30-VA is a compact, user-adjustable sensor with 0 to 10 volt output proportional to target distance from the sensor. This sensor is particularly suited for these applications:

- Roll Diameter & Tension Control
- Wind & Unwind Loop Controls
- Dancer Roll Position
- Mechanical Dancer Replacement
- Motion Control, Position, Sizing

Features:

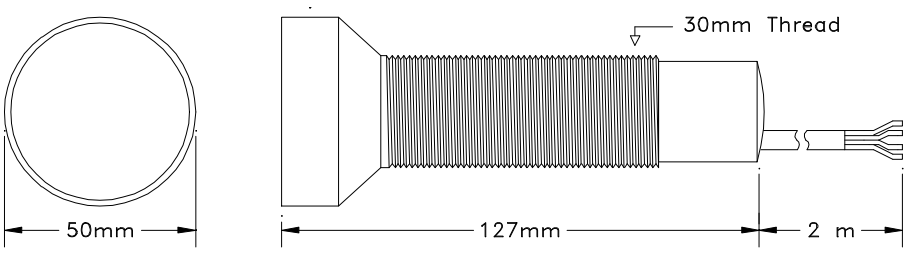
- Distance Proportional 0 to 10 VDC output, positive or negative slope
- Simple push-button adjustment eliminates potentiometers
- High sensitivity for small or poor targets
- Unaffected by target material or color
- Special user-selectable output response time algorithm for stability under noisy or poor target conditions
- LED Status Indicator quickly identifies proper and improper target conditions
- Dual-range selection permits optimum selection for each application
- Stable output if target is lost

Adjustment Features:

- Recessed rear push-button adjustment
- Set 0 and 10 VDC using actual targets
- Set short or long range operation
- Set response time filter ON or OFF
- Security “Lock” feature prevents accidental mis-adjustment

Specifications:

Range	Dual Range, Push-button selected
	Short Range: 3-40 in. (76-1000 mm)
	Long Range: 5-80 in. (127-2030 mm)
Output	0-10VDC, 100 ohm impedance
Power supply	15VDC to 30VDC @ 30ma
Repeatability	4 mm
Resolution	0.078 in. (2 mm)
Response Time	50 msec (Filter OFF), approx. 4 sec, 10-90% (Filter ON)
Filter	Digital Slow-Fast Type, push-button selectable
Beam Angle	15 degrees @ -3db, conical shape
Humidity	5 to 95% noncondensing
Temperature	0 to +70 C (+32 to +150 F)
Enclosure	Machined aluminum, black anodized
Adjustments	By push-button, permanently stored when power is off
Dimensions	Cable Length: 6.5 ft. (2 meters)
	Sensor Diameter: 2 in. (50 mm)
	Sensor Length: 5 in. (127 mm)



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This product is not recommended for applications involving personal safety or for use with hazardous or explosive materials.
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Installation & Controls

Mounting

Position the sensor body through a mounting plate hole and tighten the two nuts. The sensor beam emits perpendicularly from the sensor face. The sensor should be mounted so the target surface is perpendicular to the sensor's beam and the emitted energy is therefore reflected back to the sensor.

Wiring

Red Wire: DC Power (to sensor)

White Wire: 0-10 VDC distance output

Black Wire: Ground (input & output)

Shield: Cable shield, to be grounded at equipment end, not connected at sensor end

Rear Push-button

A push-button is recessed into the rear of the sensor. Use a pencil or other similar instrument inserted through the rear hole to press the button. The push-button is used for **Adjustment** as described in the right column.

Rear LED Indicator

An LED is mounted at the sensor rear. During Operation the indicator has 3 functions:

1. *On continuously* when detecting a stable target within the adjusted 0-10 VDC span.
2. *Blinks Slowly* when target detected within the sensor RANGE but outside the 0-10 VDC span.
3. *Blinks Quickly* when no target is detected or target is outside the sensor's RANGE.

During **Adjustment** (see column on right) the indicator serves the following functions:

1. *Blinks slowly* while the push-button is pressed and held.
2. Flashes a *short-long pattern* 3 times if an adjustment is attempted when the sensor is "locked".

Operation

The sensor is immediately operational upon power-up. As shipped from the factory, the sensor's output voltage will change proportionally with target distance as described herein for the Short Range selection (3-40 inches). To change any of the sensor adjustments, the sensor must first be UNLOCKED as described in *Adjustments*.

Adjustments:

Note: The sensor is operational upon power-up, but is initially LOCKED from adjustments. To make adjustments, the sensor must first be UNLOCKED using the 10-blink feature! *The sensor automatically locks when power is applied, or 15 minutes after unlocking it and making adjustments. An unlocked sensor can also be manually locked by repeating the 10-blink adjustment feature described below.*

All adjustments are permanently stored in the sensor's memory even if power is removed! *Adjusting consists of* ***pressing and holding the rear push-button*** *until the LED Indicator blinks a specified number of times then releasing the button. When adjusting the 0 and 10 VDC endpoints the sensor must be pointed at a target with the LED indicator either* ***On Continuously*** *or* ***Blinking Slowly****. Using this method you can set the 0 and 10 volt endpoints at any 2 distances. This means either positive or negative slope can be obtained.*

There are 7 adjustable items:

- (4 blinks) Set 0 volt endpoint anywhere in the configured RANGE (see 12 or 13 blinks)
- (5 blinks) Set 10 volt endpoint anywhere in the configured RANGE (see 12 or 13 blinks)
- (6 blinks) Turn smoothing filter on
- (7 blinks) Turn smoothing filter off
- (10 blinks) Lock / unlock sensor's adjustment capability. Sensor automatically locks at power up or 15 minutes after unlocking it and making adjustments.
- (12 blinks) Set LONG RANGE. Results in sensor RANGE of 5-80 in. (270-2032 mm), 0VDC @ 6 in. (152 mm), 10VDC @ 40 in. (1016 mm), filter=on.
- (13 blinks) Set SHORT RANGE. Results in sensor RANGE of 3-40 in (76-1016 mm), 0VDC @ 4 in. (106 mm), 10VDC @ 30 in." (762 mm), filter=on.

Adjustment Sequence

1. Unlock the sensor (press and hold the push-button for 10 blinks, then release).
2. Select the sensor RANGE (see 12 or 13 blink feature). If the target is always farther than 5 inches from the sensor face, select LONG RANGE (12 blinks) for higher sensitivity.
3. Adjust the 0 VDC (4 blinks) and 10 VDC (5 blinks) outputs. Place an actual or simulated target at each distance point and check that the LED indicator is either On Continuously or Blinking Slowly before pressing the push-button.
4. If the sensor's response time is too slow, turn off the response time filter (7 blinks).

Voltage Adjustment Example (Adjustment Sequence step 3): *Adjust the ULTRA-30-VA to provide a 0 to 10 volt output span when targets are present from 8" to 33"*

Note: Insure that the LED Indicator is either continuously ON or blinking slowly before each endpoint adjustment. This indicates the sensor is sensing a valid, in range target.

1. Place a simulated or actual target 8 in. from the transducer face. Press and hold the push-button and release it after 4 blinks. This sets the 0 volt span endpoint.
2. Place a simulated or actual target 33 in. from the transducer face. Press and hold the push-button and release it after 5 blinks. This sets the 10 volt span endpoint.

The sensor output will now move from 0 to 10V as you move the target from 8" to 33" respectively. It will hold this setting until you adjust it again, even if power is removed.

LED Indicator Operation Resulting from above Example:

- *On continuously* between 8 and 33 in. Indicates that target is in RANGE and stable.
- *Blinks Slowly* when target is between 5-8 in. or 33-80 in. Indicates that target is inside the sensors selected 5-80 in. RANGE and stable, but out of the adjusted voltage span.
- *Blinks Quickly* when target is closer than 5 inches or farther than 80 inches (outside the sensor's selected 5-80 in. RANGE). The indicator will also blink quickly if no target is detected at any distance, whether in or out of the sensors allowable RANGE.

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